



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,186	12/31/2003	Kevin Allan Dooley	2993-504US CMB/clb	5542
32292	7590	09/14/2005		
OGILVY RENAULT LLP (PWC) 1981 MCGILL COLLEGE AVENUE SUITE 1600 MONTREAL, QC H3A 2Y3 CANADA			EXAMINER RILEY, SHAWN	
			ART UNIT 2838	PAPER NUMBER

DATE MAILED: 09/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

18

<b>Office Action Summary</b>	<b>Application No.</b> 10/748,186	<b>Applicant(s)</b> DOOLEY ET AL.	
	<b>Examiner</b> Shawn Riley	<b>Art Unit</b> 2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Dec 03 filing.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/04;1/05;12/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 U.S.C. § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-30 are rejected under 35 U.S.C. §102(b) as being fully anticipated by Otto (U.S. Patent 5,008,612). Otto shows,<sup>1</sup> (in, e.g., the(ir) figures and corresponding disclosure)

As to claim 1;

A control circuit for providing, in a voltage regulated circuit, a regulated voltage output from a variable voltage and frequency source in a primary circuit having at least two primary inductors in series (100 and 103), said control circuit comprising: at least two secondary inductors (102/105) associated respectively with the two primary inductors by two common saturable cores (101 and 104) to thereby form at least two electromagnetic assemblies; a saturation control unit (including 109, 110, and 111, see, e.g., column 6 lines 1-3) capable of controlling a saturation level of said cores via said secondary

---

<sup>1</sup> Note claims will be addressed individually and the material in parentheses are the examiner's annotated comments. Further unless needed for clarity reasons, recited limitation(s), will be annotated only upon their first occurrence. Annotated claims begin with the phrase "As to claim". Claims that are not annotated are seen as having already had the invention(s) addressed previously in an annotated claim. Bolded words/phrases indicate rejected material based 112 paragraph rejections. Underlined words/phrases indicate objected to material.

Art Unit: 2838

inductors; a voltage canceling unit (e.g., 116 and connected circuitry, see, e.g. column 6 lines 60 through column 7 line 2) capable of providing an adjustable voltage source to said secondary inductors, said adjustable voltage source being out-of-phase (see, e.g., column 8 lines 7-14) with voltage in the voltage regulated circuit; and a selection unit (at 107, depending on the value, the circuit 'select either/both the cancellation amplifier including 118/116 and/or cancellation amplifier 108) for selecting, depending on a feedback signal from said voltage regulation circuit, one of said saturation control unit and said voltage canceling unit to be active to control said regulated voltage output via said electromagnetic assemblies.

As to claim 2;

The control circuit as claimed in claim 1, wherein said voltage output comprises a DC voltage value, and wherein said selection unit activates, depending on said DC voltage value, one of said voltage canceling unit and said saturation control unit (this was addressed in claim 1).

As to claim 3;

The control circuit as claimed in claim 2, wherein said saturation control unit is selected when said DC voltage value is smaller than a predetermined value, while said voltage canceling unit is selected otherwise (based on the resistances 143 vis a vis 106 and 117, *inter alia*).

Art Unit: 2838

As to claim 4;

The control circuit as claimed in claim 1, wherein said feedback signal corresponds to at least one of a voltage output and a DC current value in said control circuit, and wherein said selection unit activates, depending on said DC current value, one of said voltage canceling unit and said saturation control unit (see above explanation of claim 2).

As to claim 5;

The control circuit as claimed in claim 4, wherein said saturation control unit is selected when said DC current value is larger than a predetermined value, while said voltage canceling unit is selected otherwise(see above explanation of claim 3).

As to claim 6;

The control circuit as claimed in claim 1, wherein said at least two primary inductors comprise a first inductor and a second inductor, further wherein said at least two secondary inductors comprise a third inductor and a fourth inductor, located adjacently to said first inductor and to said second inductor, further wherein said third inductor and said fourth inductor are wound about their respective cores in opposite directions relative to their respective primary inductors (see, e.g., column 7 lines 33-36).

As to claim 7;

The control circuit as claimed in claim 1, wherein said adjustable voltage source comprises a supply transformer connected to said variable voltage source (shown as a

Art Unit: 2838

current source connected to 100/103).

For method claims 8-14 and 24-30, note that under MPEP 2112.02, the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device.

When the prior art device is the same as a device described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process. In *re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). Therefore the previous rejections based on the apparatus will not be repeated.

8. A method for providing a regulated voltage output from a variable voltage and frequency source in a primary circuit, said method comprising: obtaining a feedback signal indicative of said voltage output; determining from the feedback signal whether a threshold has been reached; and selecting one of a first control mode and a second control mode, wherein the first control mode includes controlling a saturation level in at least two series saturable core inductors in the primary circuit to thereby controllably change a voltage drop across the at least two inductors, and wherein the second control mode includes providing a variable voltage signal to secondary inductors associated via said cores with said series primary inductors, the variable voltage signal being controllably out-of-phase with the primary circuit to thereby selectively cancel at least a portion of the voltage in the primary circuit.

9. The method as claimed in claim 8, wherein said voltage output comprises a DC voltage value, and wherein said determining depends on said DC voltage value.

Art Unit: 2838

10. The method as claimed in claim 9, wherein said determining comprises activating said saturation control when said DC voltage value is smaller than a predetermined value, and providing said variable voltage signal otherwise.

11. The method as claimed in claim 8, wherein said voltage output corresponds to a DC current value in said secondary inductor, and wherein said determining, depends on said DC current value.

12. The method as claimed in claim 11, wherein said determining comprises activating said saturation control when said DC current value is larger than a predetermined value, and providing said variable voltage signal otherwise.

13. The method as claimed in claim 8, wherein said variable voltage signal provides two equal, but substantially opposite, voltages in said secondary inductors.

14. The method as claimed in claim 13, wherein said two equal voltages are substantially 180 degrees out-of-phase.

15. An apparatus for regulating voltage from a variable voltage and frequency source, the apparatus comprising: a primary circuit including the source and at least two series primary inductors each provided on respective saturable cores; and a secondary circuit including at least two series secondary inductors respectively associated with the two primary inductors via the saturable cores, the secondary circuit further including at least a saturation apparatus communicating with the secondary inductors, a voltage cancellation apparatus communicating with the secondary inductors and a control apparatus for controlling operation of the secondary circuit, wherein the saturation apparatus is adapted to selectively saturate the saturable cores, wherein the voltage cancellation apparatus is adapted to selectively provide alternating current electricity to the secondary inductors which is out-of-phase with alternating current electricity in the primary circuit, and wherein the control apparatus is adapted to control an operational status of at least one of the saturation apparatus and the voltage cancellation apparatus.

Art Unit: 2838

16. The apparatus of claim 15 wherein said primary series and said secondary series inductors form series primary-secondary inductor pairs wound about respective said cores, and wherein the pairs are wound in opposite directions relative to one another.

17. The apparatus of claim 15 wherein only the secondary inductor pairs are wound around the respective cores, and wherein the primary inductors merely pass adjacent the respective cores, to thereby provide a  $n:1$  secondary-to-primary turns ratio relative to said cores.

18. The apparatus of claim 15 wherein the saturation apparatus provides a saturation signal to the secondary inductors to thereby selectively saturate the saturable cores.

19. The apparatus of claim 15 wherein the control apparatus uses a feedback signal obtained from the primary circuit to determine said operational status.

20. The apparatus of claim 15 wherein the control apparatus permits only one of the saturation apparatus and voltage cancellation apparatus to operate on the secondary inductors at any given time.

21. An apparatus for regulating output voltage from a variable voltage and frequency source, the apparatus comprising: a primary circuit including the source and at least two series primary inductors each provided on a saturable core; a secondary circuit including at least two series secondary inductors respectively coupled with the two primary inductors via the saturable cores to provide two series inductor pairs; a first apparatus in the second circuit for regulating the voltage in the primary circuit via the coupled series inductor pairs, the first apparatus adapted to controllably reduce an output voltage of the primary circuit to a desired output level; a second apparatus in the second circuit for regulating the voltage in the primary circuit via the coupled series inductor pairs, the second apparatus adapted to controllably increase the output voltage of the primary circuit to a desired output level; and a selector apparatus adapted to determine when said first and second apparatus are active.



Art Unit: 2838

22. The apparatus of claim 21 wherein said primary series and said secondary series inductors form series inductors pairs wound about respective said cores, and wherein the pairs are wound in opposite directions relative to one another.

23. An apparatus for regulating output voltage from a variable speed permanent magnet generator when connected to a variable load system, the apparatus comprising: first electronic means for automatically reducing the output voltage to a desired output level; second electronic means for automatically increasing the output voltage to a desired output level; and a selector apparatus adapted to determine which of said first and second electronic means is active at a given time.

24. A method of regulating the voltage in a primary circuit having a variable voltage and frequency electrical power source, the method comprising the steps of: providing at least two series-connected primary inductors in the primary circuit, the primary inductors having respective saturable cores; providing a secondary circuit having at least two series-connected secondary inductors, the secondary inductors each respectively electromagnetically coupled with said primary inductors via said saturable cores; selectively saturating said cores to produce a desired voltage drop across the primary inductors to thereby regulate the voltage in the primary circuit; and selectively providing a cancellation voltage to the secondary inductors to thereby regulate the voltage in the primary circuit.

25. The method of claim 24 wherein only one of the steps of selectively saturating said cores and selectively providing a cancellation voltage is performed at any given time.

26. The method of claim 24 wherein the step of selectively saturating said cores includes providing a saturation current to the secondary inductors.

27. The method of claim 24 wherein the steps of selectively providing a cancellation voltage includes providing an alternating current voltage to the secondary inductors which is opposite in phase to an alternating current voltage

Art Unit: 2838

in the primary circuit.

28. The method of claim 24 wherein the step of selectively saturating said cores includes increasing an output voltage of the primary circuit to a nominal output level.

29. The method of claim 24 wherein the steps of selectively providing a cancellation voltage includes decreasing an output voltage of the primary circuit to a nominal output level.

30. The method of claim 24 wherein the steps of providing secondary inductors coupled with the primary inductors includes the step of coupling the inductors such that a first primary-secondary pair is wound about its respective core in an opposite direction to a direction which the other primary-secondary pair is wound about its respective core.

### *Allowable Subject Matter*

3. No claims are allowable over the prior art of record.


### *Conclusion*

Any inquiry from other than the applicant/attorney of record concerning this communication or earlier communications from the Examiner should be directed to the Patent Electronic Business Center (EBC) at 1.866.217.9197. Any inquiry from a member of the press concerning this communication or earlier communications from the Examiner or the application should be directed to the Office of Public Affairs at 703.305.8341. Any inquiry from the applicant or an attorney of record concerning this communication or earlier communications from the Examiner should be directed to Examiner Riley whose telephone number is 571.272.2083. The Examiner can normally be reached Monday through Thursday from 7:30-6:00 p.m. Eastern Standard Time. The Examiner's Supervisor is Mike Sherry who can be reached at 571.272.2084. Any inquiry about a case's location, retrieval of a case, or receipt of an

Art Unit: 2838

amendment into a case or information regarding sent correspondence to a case **should be directed to 2800's Customer Service Center** at 571.272.2815. Any papers to be sent by fax MUST BE sent to fax number **571-273-8300**. Any inquiry of a general nature of this application should be **directed to the Group receptionist** whose telephone number is 571.272.2800. Status information of cases may be found at <http://pair-direct.uspto.gov> wherein unpublished application information is found through private PAIR and published application information is found through public PAIR. Further help on using the PAIR system is available at 1.866.217.9197 (Electronic Business Center).

August 05

  
**Shawn Riley**  
**Primary Examiner**